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ABSTRACT

The study evaluated the effectiveness of an electric vibrator on the deceleration and/or extinction of 10 self abusive and aberrant behaviors in a profoundly retarded, nonambulatory 25 year old female who could not hear, see, or speak. At the end of 41 twenty minute sessions, seven of the target behaviors approached extinction and three were substantially reduced. Findings suggested that electric vibration may act as a powerful reinforcer for other sensorially impaired individuals who exhibit self abusive behaviors. (Author/SBH)

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# THE USE OF A VIBRATOR TO REDUCE SELF-ABUSIVE BEHAVIORS IN A MENTALLY AND SENSORIALLY HANDICAPPED INDIVIDUAL

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ABSTRACT

The study evaluated the effectiveness of an electric vibrator on the deceleration and/or extinction of ten self-abusive and aberrant behaviors in a profoundly retarded, nonambulatory 25-year-old female who could neither hear, see, nor speak. At the end of 41 twenty-minute sessions, seven of the target behaviors approached extinction and three were substantially reduced. The findings suggest that electric vibration may act as a powerful reinforcer for other sensorially-impaired individuals who exhibit self-abusive behaviors.

The phenomena of self-abusive behaviors are relatively common among severely and profoundly retarded persons in institutional settings. Because they are often of long-standing and tend to become more complex and ritualistic over time, they appear to resist extinction despite numerous interventions that are attempted to eliminate the maladaptive responses. Whether the self-abusive behaviors are negative attention-getting devices or a form of sensory input remains speculative as does the question of whether these persons are as sensitive to pain as other individuals. Finding ways to rectify self-abusive behaviors becomes even more difficult with children afflicted with multiple sensory handicaps as there are fewer modalities through which to communicate. For example, a deaf and blind child cannot receive input through the visual and auditory senses. Learning must be acquired and reinforced through the olfactory, gustatory, or tactile senses. Programming becomes a perplexing problem as few break-throughs have been found to modify the self-abusive behaviors of severely/profoundly retarded sensorially-handicapped persons.

Recent successes have been reported in the literature of the efficiency of sensory stimulation in the form of tactile vibration as a reinforcer for learning a variety of new behaviors by profoundly mentally handicapped subjects. Meyerson, Kerr, and Michael (1967) found that vibration developed a lever-pressing response which was incompatible with self-mutilation responses in an autistic child. In 1969 Bailey and Meyerson found that when vibration was available to a profoundly retarded child 24 hours per day no decrement in the daily rate of lever-pressing responding was seen over a three-week period. Rehegen and Thelen (1972) found that a vibrating hand massager compared favorably with a food reinforcer to train button-pressing responses in 40 severely and moderately retarded children. Johnson, Firth, and Davey (1978) found that simple discrimination tasks were acquired more rapidly by eight of nine severely mentally

handicapped adults when a vibrator/massager was employed as a reinforcer than when praise was used. They also noted that this preference for vibration over praise reinforcement did not seem to be related to social age. Halliday and Evans (1974), by applying a battery-powered toothbrush to the joints, fingers, and palms of the hands of a blind, hearing-impaired, profoundly retarded adolescent girl, increased significantly her smiling behavior. The foregoing studies show that vibration as a reinforcer can initiate and maintain responses which were not previously a part of the retardates' response repertoires or occurred at a low frequency rate, however none has included the assessment of tactile vibration in conjunction with the extinction of self-abusive behaviors among the population. The aim of the present study was to evaluate the effectiveness of vibration to decelerate and/or extinguish a number of self-abusive behaviors in a profoundly retarded individual who could neither hear, see, or speak.

## METHOD

### Subject

The subject was a 25-year-old Oriental female who had been institutionalized since age two. Her IQ was estimated to be below 5 and her diagnosis was profound mental retardation due to Unknown Prenatal Influence and associated with seizure disorder. She was a nonambulatory paraplegic but had use of her right arm. Her left hand was contractured. Her history of self-abusive behaviors dated from the time of admission to the facility and increased in variety and frequency as the years passed. No intervention techniques had been found to eliminate the stereotypic behavior patterns which she had developed. As a result, attempts to train self-help skills, communication, or recreational responses were futile. Except for physical therapy programming she remained a wheelchair-bound study in self-destruction.

Procedure

Baseline was taken during ten 20-minute sessions of the subject's self-abusive and aberrant behaviors. They included self-biting, mouthing fingers, fingering teeth, yelling, pulling lip, fingering ear, head swinging, grinding teeth, poking eyes, and self-hitting. Two staff members, a psychologist and a mental health therapy aide, initiated and implemented the program together. The apparatus used for reinforcement was the vibrating portion of an electric toothbrush. In Phases II and IV of the study the vibrator was placed in the subject's right hand during intervals of quiet, however brief, when no maladaptive responses occurred. The vibrator was reintroduced if the subject dropped it but was withdrawn if self-abusive or maladaptive behaviors were renewed. As intermittent reinforcement a pat on the shoulder was given for appropriate responding during times when the program was not being conducted.

There were 41 sessions in all in the four-phase study. Phase I was comprised of 10 baseline sessions; Plase II of 13 reinforcement sessions; Phase III of 8 sessions in which reinforcement was withdrawn; and Phase IV in which reinforcement was reinstated.

## RESULTS

Upon presentation of the vibrating stimulus there was an immediate change in the subject's affect. She appeared delighted with the vibrator, laughed and made humming sounds as she held it to her ear, neck, and head. The results of the intervention were analyzed statistically. A one-tailed t-test was used to ascertain the effect of the treatment variable on the target behaviors.

Self-hitting responses were reduced measurably during Phase II and extinguished during Phase IV ($t = 2.024$; $df = 21$; $P < .05$). Prior to extinction self-hitting had occurred as frequently as 288 times per 20-minute session.

Self-biting responses approached extinction in both Phase II and Phase IV but because of the variability of observations in the first phase significance was not obtained. There was a mean rate per session of 49.5 self-biting responses in Phase I compared to a rate of 1.7 self-biting responses in the final phase of the study.

Pulling lip responses were reduced significantly in both of the reinforcement phases ($t = 5.366$; $df = 21$; $P < .001$ and $t = 5.505$; $df = 18$; $P < .001$ respectively). In Phase III the response rate averaged 182.1 pulling lip responses per session, whereas the behavior diminished to a mean rate of 24.2 responses in the reinstatement of reinforcement phase.

Head swinging was second only to pulling lip responses in the frequency with which it occurred. In Phases II and IV a significant reduction of head swinging occurred ($t = 2.309$; $df = 21$; $P < .05$ and $t = 2.813$; $df = 18$; $P < .01$ respectively). The head swinging reduced to a mean of 24.2 responses per session in the final phase as compared to a mean of 182.1 responses in the preceding phase.

Grinding teeth was substantially and significantly reduced as a result of the vibration reinforcement. Phase II showed a significant change at the .05 level ($t = 2.376$; $df = 21$), while Phase IV was significant at the .001 level ($t = 2.954$; $df = 18$). Baseline showed a mean occurence of 88.1 teeth grinding responses per session as compared with a mean of 12.7 responses in Phase IV.

Fingering teeth was described as the scraping of the four fingernails of the hand back and forth across the teeth. There was a steady increase in the mean rate of the behavior during the first three phases of the study indicating that the reinforcement stimulus was not effective initially, however when it was reinstated in the last phase of the study a dramatic reduction in the behavior occurred ($t = 2.204$; $df = 18$; $P < .05$). In Phase III fingering

teeth occurred at a mean rate of 159 responses per session but diminished to a mean of 8.7 responses by Phase IV.

Yelling substantially lessened when the vibration stimulation was introduced and increased with its removal. From a mean occurrence of 37.3 yelling responses in Phase III the behavior approached extinction in Phase IV with a mean frequency of 2.5 yells per session ($t = 2.554$; $df = 18$; $P < .01$).

Mouthing fingers was described as pushing all five fingers down her throat. As with the fingering teeth responses the behavior did not show a decrease when vibration was first introduced, however with the reinstatement of the reinforcement in Phase IV the decrease was significant at the .05 level ($t = 1.763$; $df = 18$).

Fingering ears occurred in conjunction with a buzzing sound the subject emitted while pressing her ear. While the behavior diminished from a mean rate of 26.8 responses in Phase III to a mean of 5.4 responses in Phase IV the difference was not significant.

Poking eyes showed a steady and significant decline in the last three phases of the study as compared with baseline. (Phase II, $t = 3.210$; $df = 21$; $P < .01$; Phase III, $t = 2.492$; $df = 16$, $P < .05$; Phase IV, $t = 2.382$; $df = 18$; $P < .05$) However, the vibration reinforcement per se appeared not to be the only variable operating as its withdrawal did not cause the expected decrease in eye poking responses. Competion for time of emission of other maladaptive behaviors may have caused the steady decrease.

## CONCLUSIONS

After a history of more than two decades of self-abusive behaviors on what appeared to be an irreversible course, the results of the two-month intervention indicate that innovative techniques can ameliorate such long-standing mal-

adaptive responses. As there was substantial reduction to near-extinction levels of the ten self-abusive and aberrant target behaviors, the findings of the study suggest that electric vibration may act as a powerful reinforcer for other sensorially impaired, mentally handicapped individuals who exhibit similar symptomatology.

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288

SELF-HITTING

SUSAN

RATE OF SELF-HITTING

168
162
156
150
144
138
132
126
120
114
108
102
96
90
84
78
72
66
60
54
48
42
36
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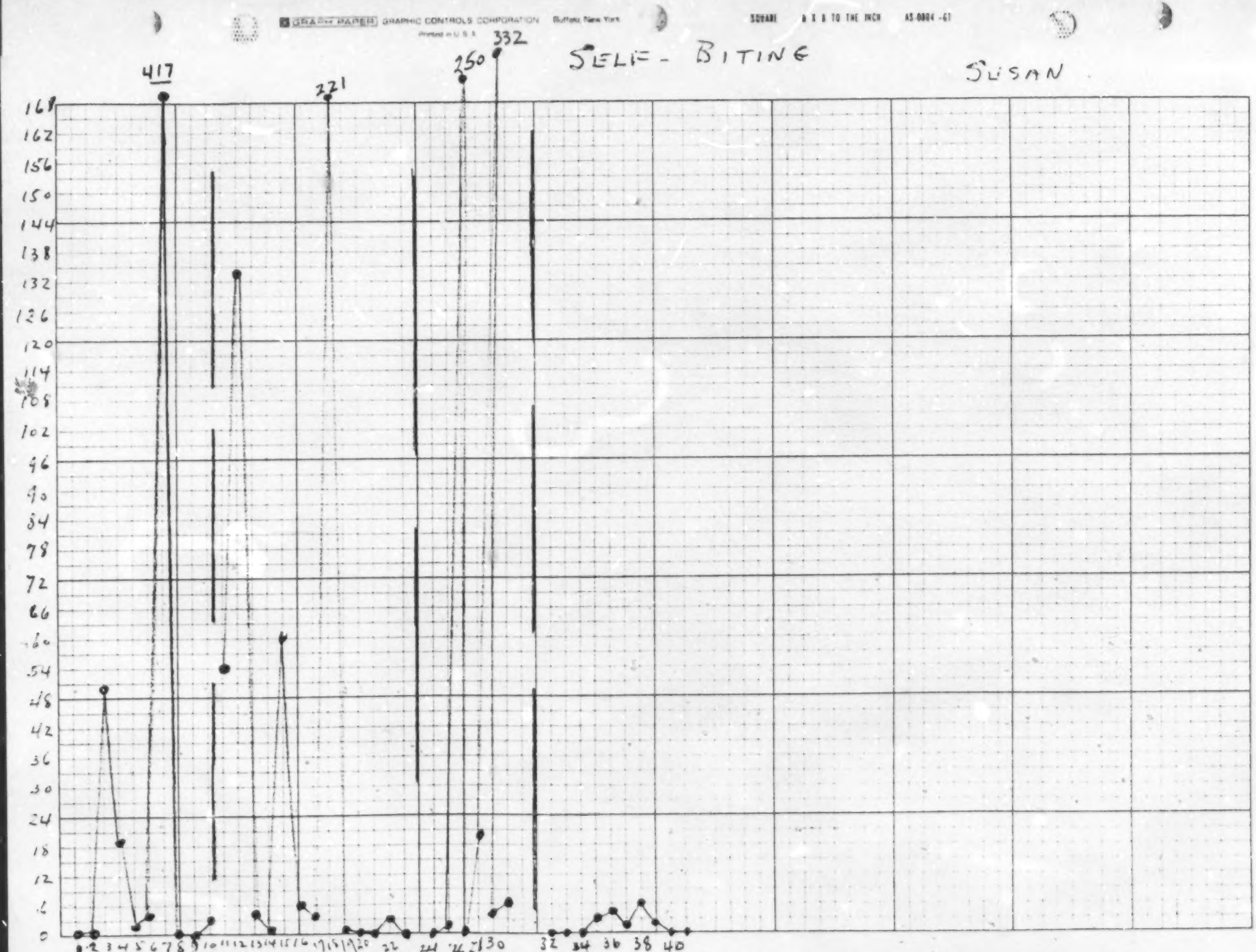
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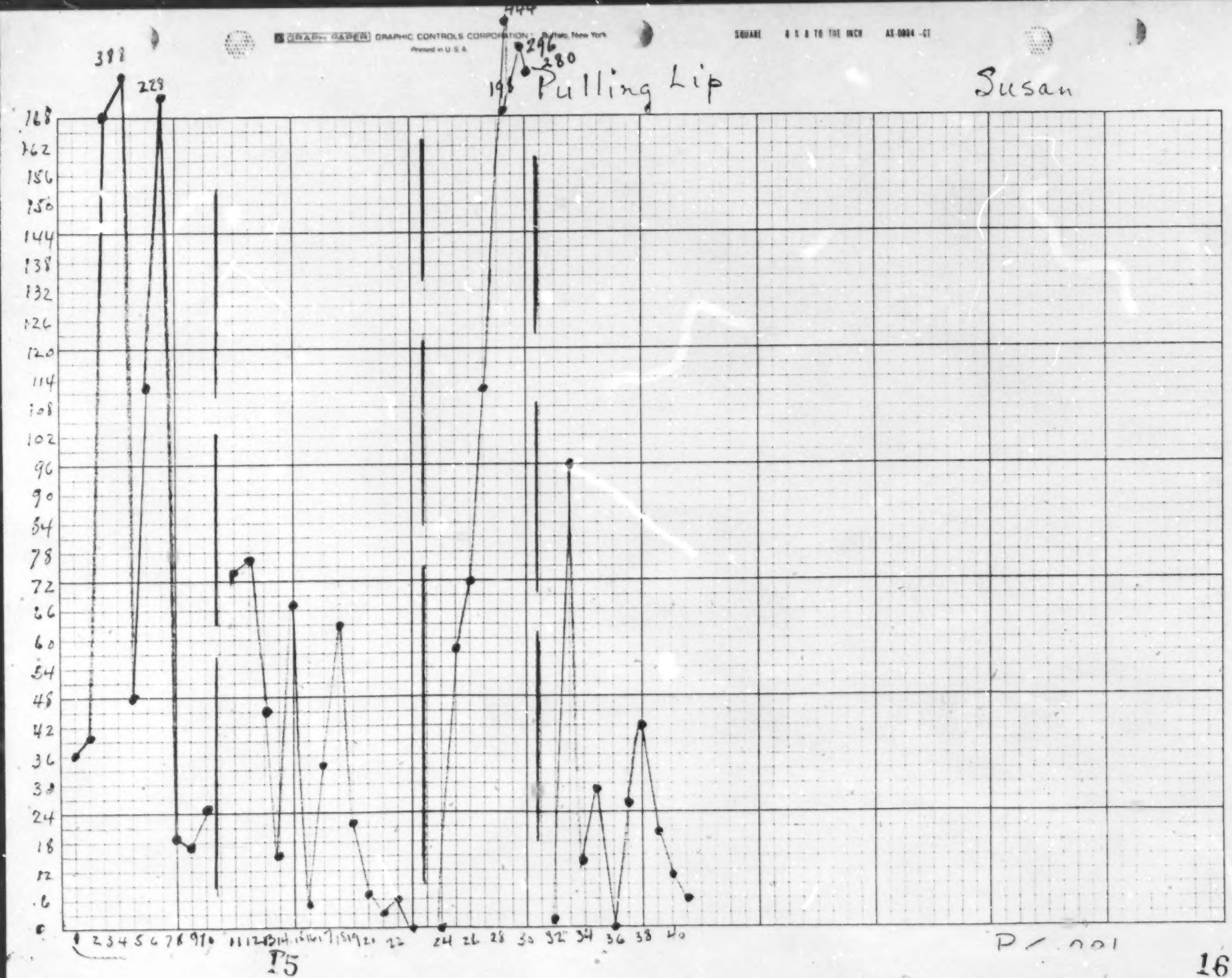
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Pulling Lip
Susan
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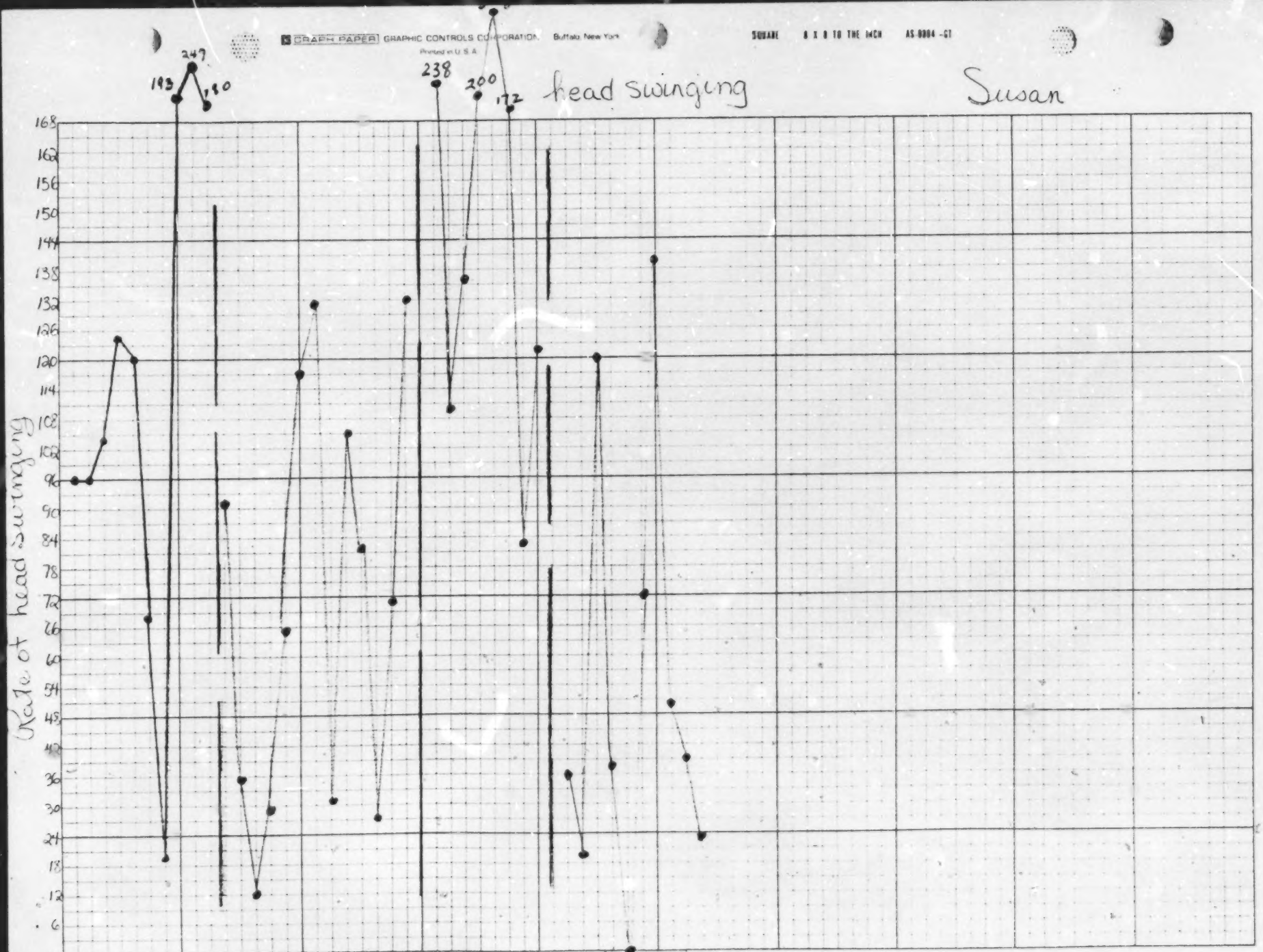
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head swinging
Susan
Rate of head swinging
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193
180
238
200
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132
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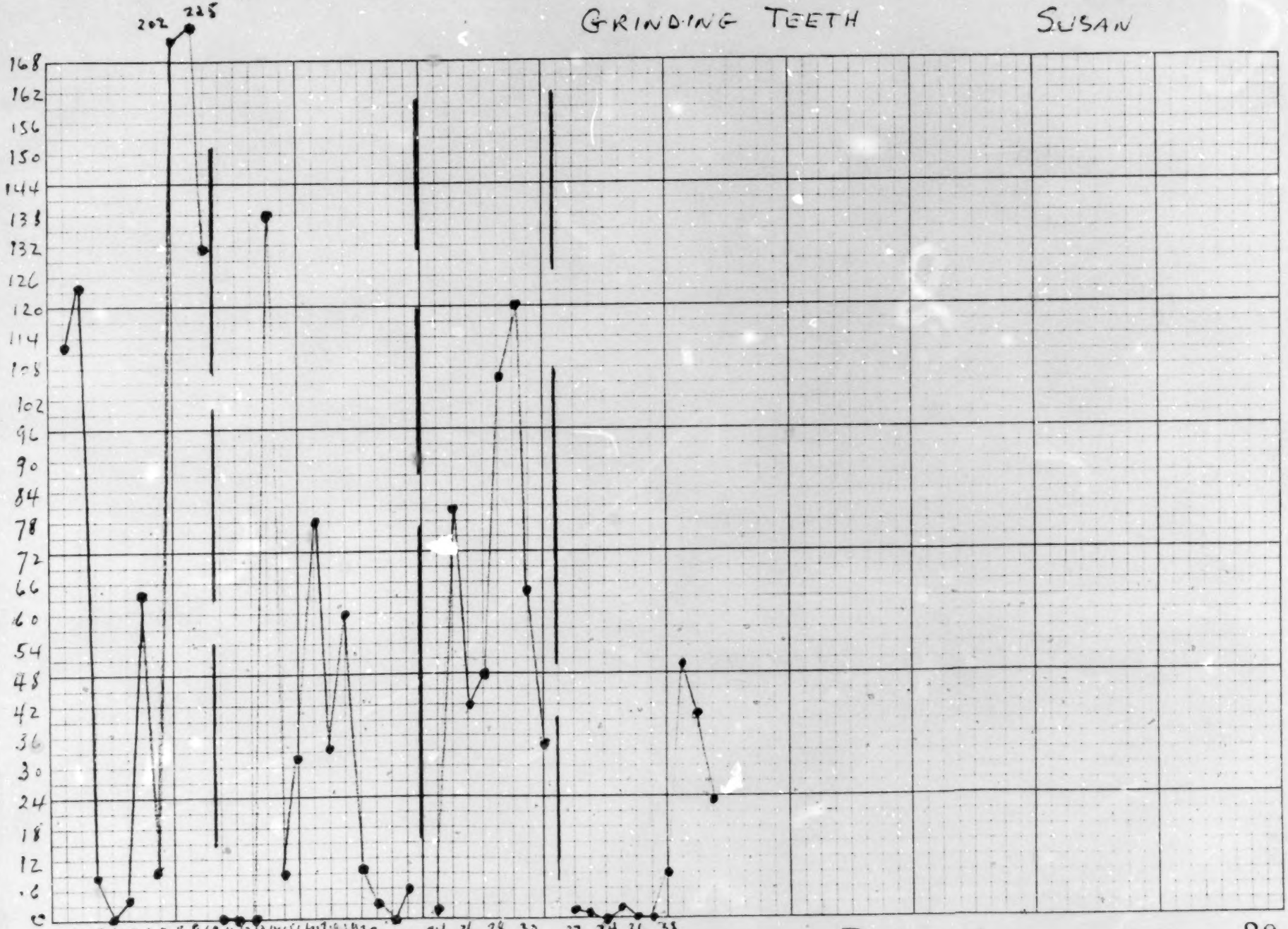
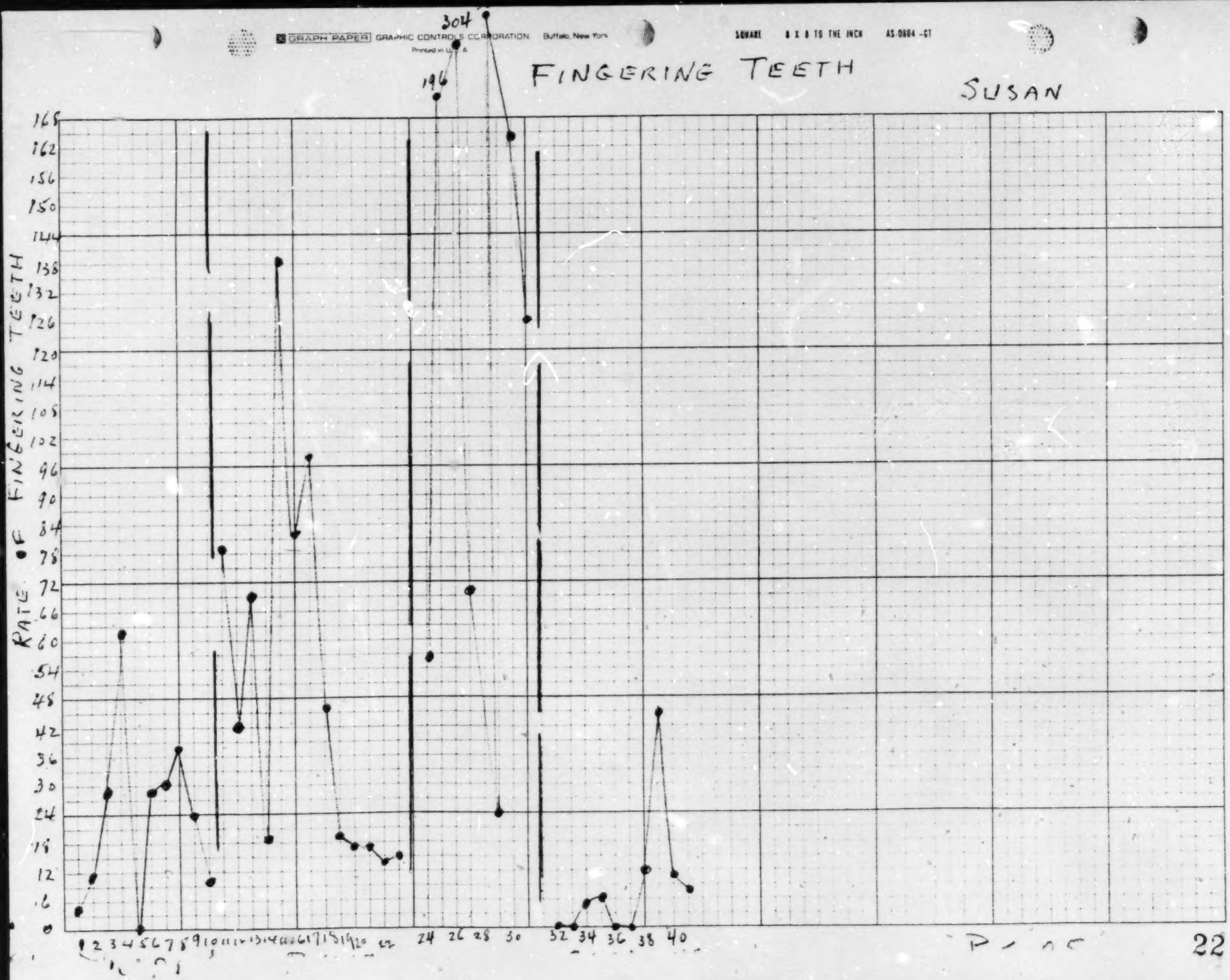
# GRINDING TEETH

SUSAN

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FINGERING TEETH
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# YELLING

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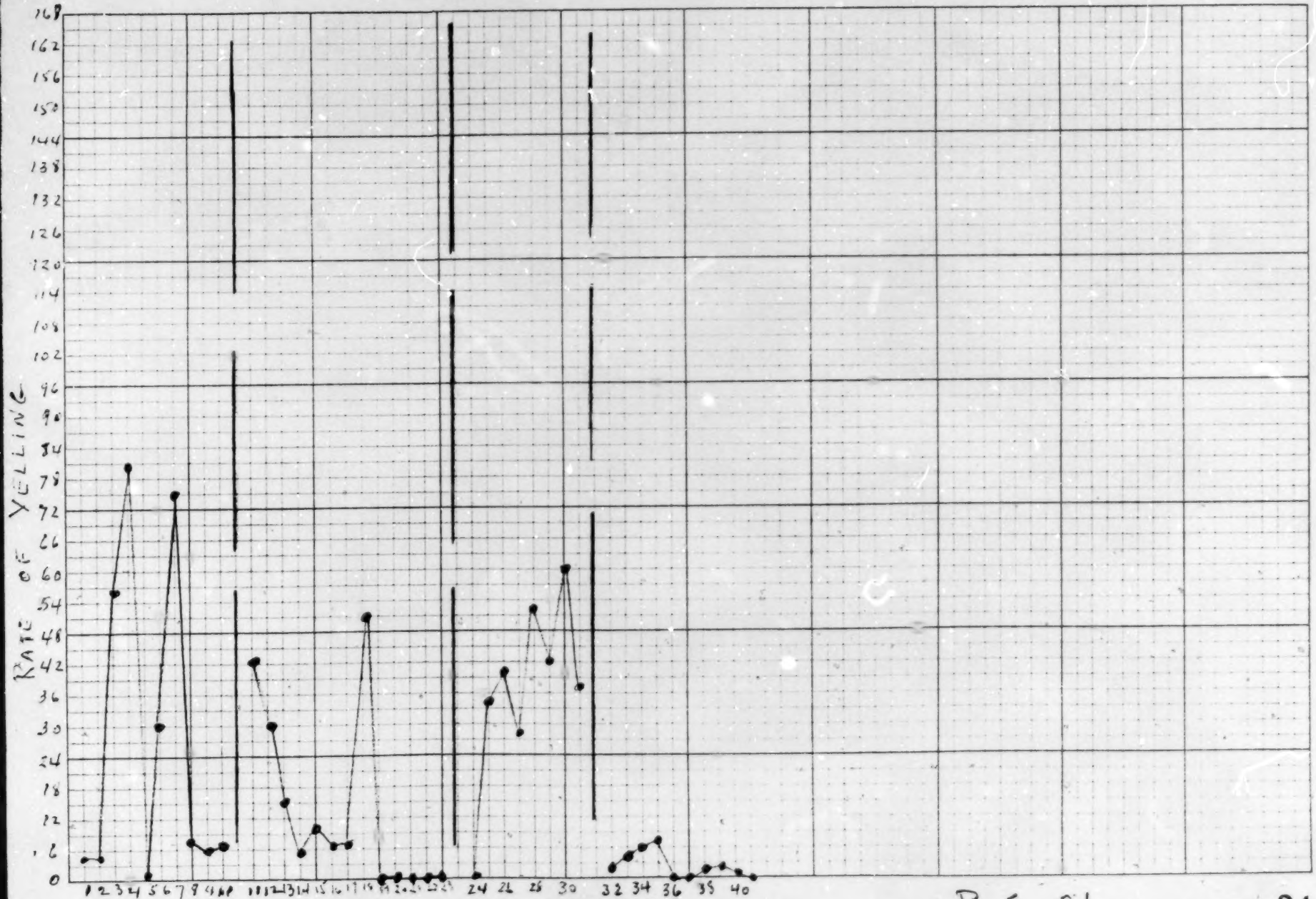

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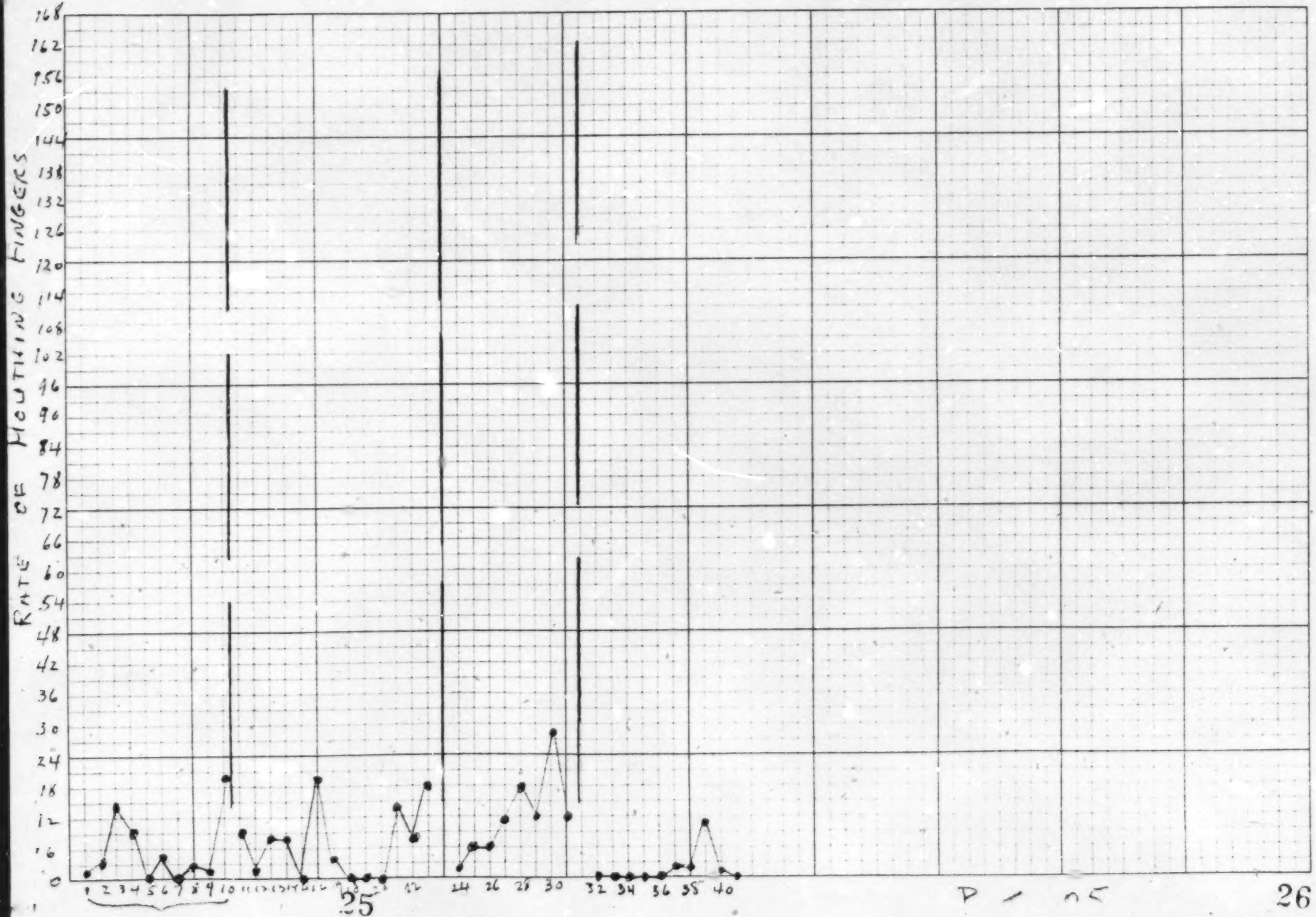
# MOUTHING FINGERS

SUSAN

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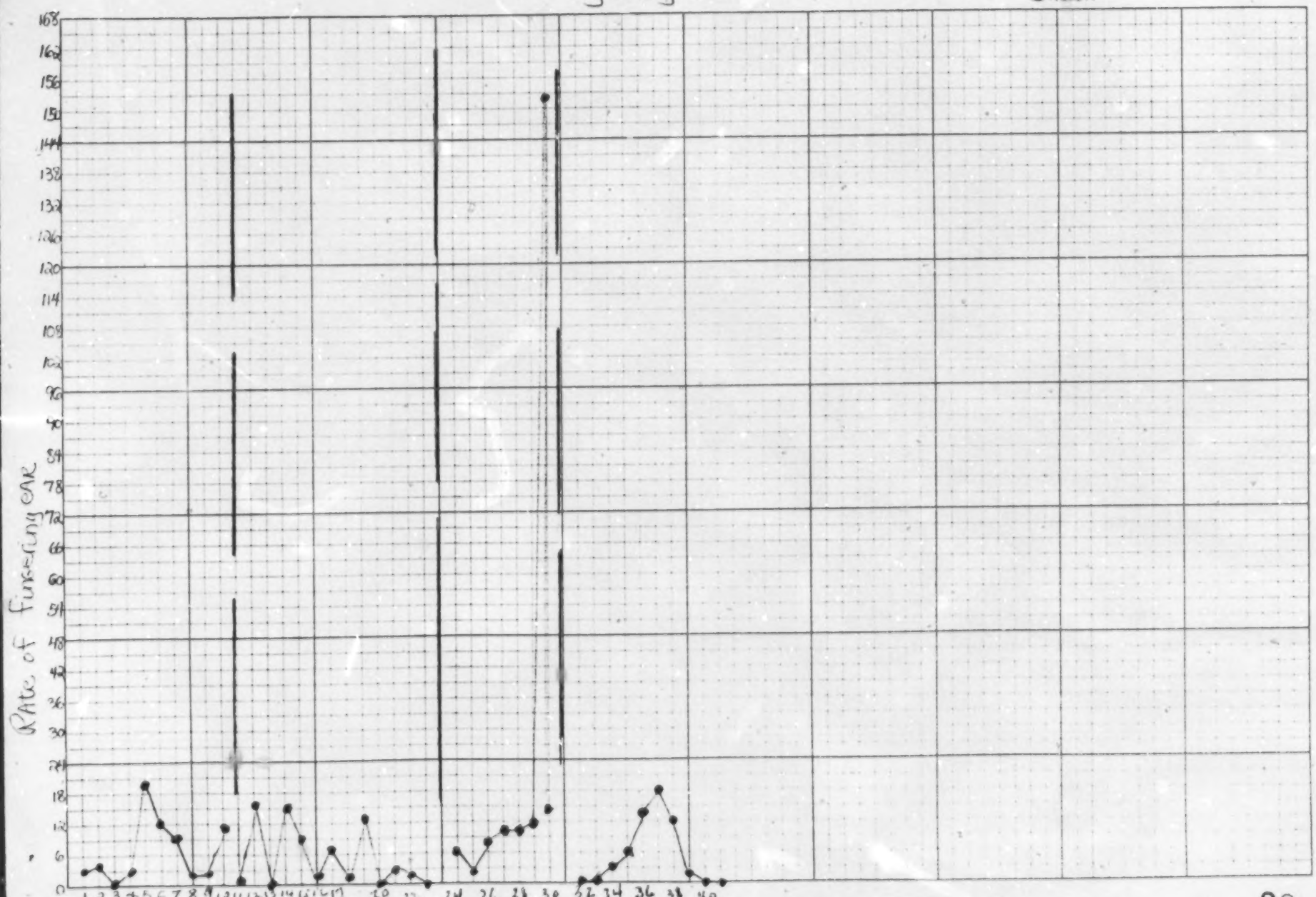
# Fingering Ear

Susan



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# POKING Eyes

Susan

Rate of Poking Eyes

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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 22 24 26 28 30 32 34 36 38

29

30